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Abstract

PURPOSE: To make it possible to obtain a high-purity thin semiconductor film controlled by the thickness of a signal atomic layer by a method wherein such short-wavelength ultraviolet rays as to decompose a group V raw material are emitted on a substrate and the group V raw material in synchronization with the supply of the group V raw material.

CONSTITUTION: It is performed as one cycle that an organometallic compound containing a group III element and a hydride or an organic compound containing a group V element are all transported alternately by carrier gas on a heated substrate and atomic layers consisting of a III-V compound semiconductor are grown on the substrate one layer by one layer in the operation of the one cycle. At this time, such short-wavelength ultraviolet rays as to decompose a group V raw material are emitted on the substrate and the group V raw material in synchronization with the supply of the group V raw material, the group V raw material is decomposed in a vapor phase, hydrogen radicals are generated and the hydrogen radicals are made to react to organic groups on the substrate surface. Thereby, a low-carbon concentration and high-purity thin semiconductor film controlled by the thickness of the single atomic layer can be obtained.